

Counter Nuclear, Biological, and Chemical Operations



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Commander, Air Force Doctrine Center

FOREWORD

The threat or use of nuclear, biological, and chemical (NBC) weapons is among the most alarming of all emerging threats to global security. NBC weapon use can be overt or covert, and the effects may be immediately evident or detected only after the passage of time. In all cases, NBC weapons may adversely impact large numbers of people, civilian and military. To project combat power using the Air Force core competencies in an NBC environment requires a four-layered approach: proliferation prevention, counterforce, active defense, and passive defense. The integration of these concepts into aerospace operations will enable the aerospace forces of the United States to successfully operate in confrontations with an adversary armed with NBC weapons. Air Force Doctrine Document (AFDD) 2-1.8, *Counter NBC Operations*, provides guidance for understanding, planning, and executing this part of aerospace warfare.



Lance L. Smith
Major General, USAF
Commander, Air Force Doctrine Center

16 August 2000

TABLE OF CONTENTS

	Page
INTRODUCTION	v
CHAPTER ONE—Counter NBC Operations	1
Overview	1
NBC Weapons Characteristics	2
Nuclear	2
Radiological	2
Biological	2
Chemical	3
Delivery Methods	3
CHAPTER TWO—Aerospace Power in Counter NBC Operations	5
Major Components of Counter NBC Operations	6
Proliferation Prevention	6
Counterforce Operations	7
Active Defense	8
Passive Defense	10
Crosscutting Elements	11
Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR)	11
Counter NBC Terrorism	13
Core Competencies and Counter NBC Operations	14
CHAPTER THREE—Command Relationships	15
Command Authority	15
Operations on United States Territory	16
Coordination with Other Organizations	17
CHAPTER FOUR—Planning and Support Operations	19
General	19
Operational Risk	19
Targeting Considerations	20
Types of Targets	20
Prestrike Planning	21
Logistics and Sustaining Operations	21
Health Service Support Operations	22
Medical Intelligence	23
Casualty Management	23
Aeromedical Evacuation	23
Legal Issues	24
CHAPTER FIVE—Education, Training, and Exercises	25
Education	25
Training	25
Accession Training	26
Operational Training	26
Continuation or Recurring Training	26

Exercises and Wargames	27
Summary	27
Suggested Readings	29
Glossary	33

INTRODUCTION

PURPOSE

AFDD 2-1.8 establishes operational doctrine for the United States Air Force to conduct operations to counter NBC weapons. It articulates fundamental Air Force principles for the application of combat force and provides commanders operational-level guidance on the employment and integration of Air Force resources to achieve desired objectives.

APPLICATION

This AFDD applies to all Air Force military and civilian personnel (includes Air Force Reserve Command [AFRC] and Air National Guard [ANG] units and members). This document is authoritative but not directive; commanders are encouraged to exercise judgement in applying this doctrine to accomplish their missions.

SCOPE

The need to counter the threat or use of NBC weapons applies across the full spectrum of aerospace operations. Counter NBC operations range from deterring or preventing an adversary from acquiring or using these weapons, to disrupting and limiting an attack, to surviving and restoring operations if attacked. This document integrates the Air Force approach to countering adversary NBC operations.

CHAPTER ONE

COUNTER NBC OPERATIONS

We saw figures running wildly in confusion over the fields. Greenish-gray clouds swept down upon them, turning yellow as they traveled over the country blasting everything they touched and shriveling up the vegetation. No human courage could face such a peril. Then there staggered into our midst French soldiers, blinded, coughing, chests heaving, faces an ugly purple color, lips speechless with agony, and behind them the gas-soaked trenches, we learned that they had left hundreds of dead and dying comrades. It was the most fiendish and wicked thing I have ever seen.

Description of German chlorine gas attack at Ypres, 22 April 1915
O. S. Watkins

OVERVIEW

The proliferation of NBC weapons and the means to deliver them present a serious security threat to US forces, allies, and interests around the world. Public attention has traditionally focused on nuclear weapons proliferation, but the spread of biological and chemical weapons also poses a threat to national and international security. Limited numbers of NBC weapons could inflict heavy casualties on military forces and civilian populations, degrade the effectiveness of US combat and combat support units, and counter US conventional military superiority. *Threatened NBC use can reduce the effectiveness of friendly forces and can create serious political and psychological repercussions disproportionate to its potential impact on military operations.*

Counter NBC operations are those activities taken to detect, deter, disrupt, deny, or destroy an adversary's NBC capabilities and to minimize the effects of an enemy NBC attack on operations. The main interlinked components of counter NBC operations are proliferation prevention, counterforce, active defense, and passive defense. There are also two crosscutting elements that affect the primary counter NBC components: command, control, computers, communication, intelligence, surveillance, and reconnaissance (C4ISR) and counter NBC terrorism.

Commanders should assess and plan for the effects of an adversary's use of NBC weapons across the full operational spectrum from peacetime engagement to full-scale war. This requires an assessment of an adversary's capability and possible intent to employ NBC weapons. It also requires commanders to identify the effects of NBC weapons on the

Terror Effect



From 18 January to 28 February 1991, 39 Iraqi-modified SCUD missiles reached Israel. Although many were off target or malfunctioned, some of them landed in and around Tel Aviv. Approximately 1,000 people were treated as a result of missile attacks, but only 2 died. Anxiety was listed as the reason for admitting 544 patients and atropine overdose for hospitalization of 230 patients. Clearly these conventionally armed SCUDs were not effective mass casualty weapons, yet they caused significant disruption to the population of Tel Aviv. Approximately 75 percent of the casualties resulted from inappropriate actions or reactions on the part of the victims. Had one of the warheads contained a chemical or biological agent that killed or intoxicated a few people, the "terror effect" would have been even greater.

Medical Aspects of Chemical and Biological Warfare

ability of US and friendly forces to conduct operations and plan to counter such an attack if it occurs. Aerospace forces need to continue combat operations, even in an NBC environment.

The NBC threat is truly a global threat. US citizens and military personnel may be targeted anywhere in the world. Use of NBC weapons by nation states or nonstate entities against targets within US borders is a real possibility. **Aerospace forces prepare to counter the NBC threat by properly employing a balanced approach through planning, education, training, and close coordination with other organizations.** Furthermore, a properly trained, equipped, and exercised force may deter an adversary from choosing to employ NBC weapons.

NBC WEAPON CHARACTERISTICS

NBC weapons technologies present separate and distinct threats to personnel, equipment, and operations. The physical effects of these weapons vary significantly, depending upon type of weapon, delivery means, agent, dispersal, type of target (whether personnel or equipment), and environmental factors.

Nuclear

The technologies involved with the development, production, and physical effects of nuclear weapons are well known, but the greatest difficulty in creating a weapon is acquiring enough fissile material—enriched uranium or plutonium, neither occurring in nature—to promote fission to take place. Over the past decades, nonproliferation efforts have focused on controlling the spread of these dangerous commodities. Despite efforts to prevent proliferation, nuclear weapons technology has found its way to several developing countries and the potential exists for nonstate entities hostile to the US and its allies to develop and use nuclear weapons.



Along with the devastating damage to personnel, equipment, and structures from blast, heat, and radiation effects, nuclear weapons can cause massive destruction and disruption to electronic infrastructure. Employed to optimize electromagnetic pulse (EMP) damage, a nuclear device may destroy or disable equipment and critical infrastructure while minimizing direct casualties.

Despite the complexity and expense, a few developing countries have produced nuclear weapons.

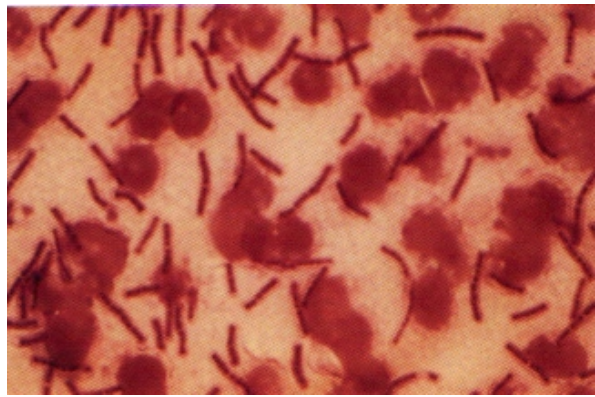
Radiological

Radiological dispersal devices (RDDs) are a variation of nuclear weapons. An RDD is any device, other than a nuclear explosive device, that disseminates radiation to cause damage or radiation injury. Sources of radiological material are spent fuel from nuclear reactors and low-level radioactive materials such as medical or industrial wastes. Some of these materials may be readily available in countries having insufficient control standards for this type of waste. *An RDD contaminates a wide area, causing casualties by inducing radiation sickness.* The device's effectiveness depends upon the type and amount of radioactive material and its dispersion. The direct effects may be militarily insignificant, but the political and psychological effects could destroy a coalition or disrupt the deployment of combat forces.

Biological

Biological agents are potentially capable of spreading disease to large segments of a target population, or they may be used to attack livestock, or crops. Pathogenic microorganisms enter the body through

portals of entry such as the lungs, digestive tract, mucous membranes, cuts and abrasions in the skin, and then multiply, eventually overcoming the body's natural disease-fighting capabilities. *Because an incubation period is required before pathogenic microorganisms affect target populations, adversaries may consider releasing them covertly just prior to or early in a conflict.* Different means have been invented over the years to deliver pathogens clandestinely in aerosolized forms. Toxins are poisonous by-products of microorganisms, plants, and animals. Some toxins can be synthetically produced. Toxins work by interfering with cell and tissue functions such as breathing or control of muscle functions. Some of these weapons may be produced using pharmaceutical or fermentation facilities, and small amounts may have wide-spread effects.



Stain of peripheral blood smear from a rhesus monkey that died of inhalation anthrax.

Chemical

Due to the ease of their manufacture, almost any chemical, fertilizer, or pesticide factory has the potential to make chemical agents that can incapacitate or kill a target population if made into a weapon. Although they are easy and cheap to make, chemical agents can be difficult to efficiently or surreptitiously deliver. *Chemical agents are categorized according to their physiological effects: choking, blister, blood, and nerve.* Large quantities of chemical agents may be needed to achieve mass casualties, but even limited use can have devastating psychological effects sufficient to achieve strategic objectives.

Delivery Methods

Delivery means for NBC weapons can vary widely. Aircraft and artillery have been capable of delivering NBC weapons for decades. Newer delivery platforms include ballistic or cruise missiles, which pose complex challenges to aerospace forces. Clandestine delivery means are limited only by the imagination, but can include personnel, ground vehicles, watercraft, unmanned aerial vehicles (UAVs), or infected humans or animals.



NBC weapons can be delivered by a variety of means to include helicopters equipped with sprayers that spread aerosol over a wide area.

CHAPTER TWO

AEROSPACE POWER IN COUNTER NBC OPERATIONS

New weapons require...new and imaginative methods. Wars are never won in the past.

Douglas MacArthur

A balanced and integrated strategy of proliferation prevention, counterforce, active defense, and passive defense efforts is vital to counter the NBC threat across the full spectrum of conflict and enable the Air Force to bring its core competencies to bear to support commanders' objectives.

As shown in figure 2.1, there are four integrated components of counter NBC operations. The first, proliferation prevention, restricts the spread of NBC weapons by supporting political and diplomatic efforts such as export controls and treaty agreements. By limiting adversary NBC capabilities, proliferation prevention eases the challenges faced by the other three components. The second component, counterforce, attacks adversary NBC weapons and their associated production, transportation, and storage facilities prior to their use in order to reduce the NBC threat to friendly operations. The third component, active defense, intercepts conventional and unconventional NBC delivery before it reaches friendly forces. The fourth component, passive defense, protects friendly forces and infrastructure from NBC threats.

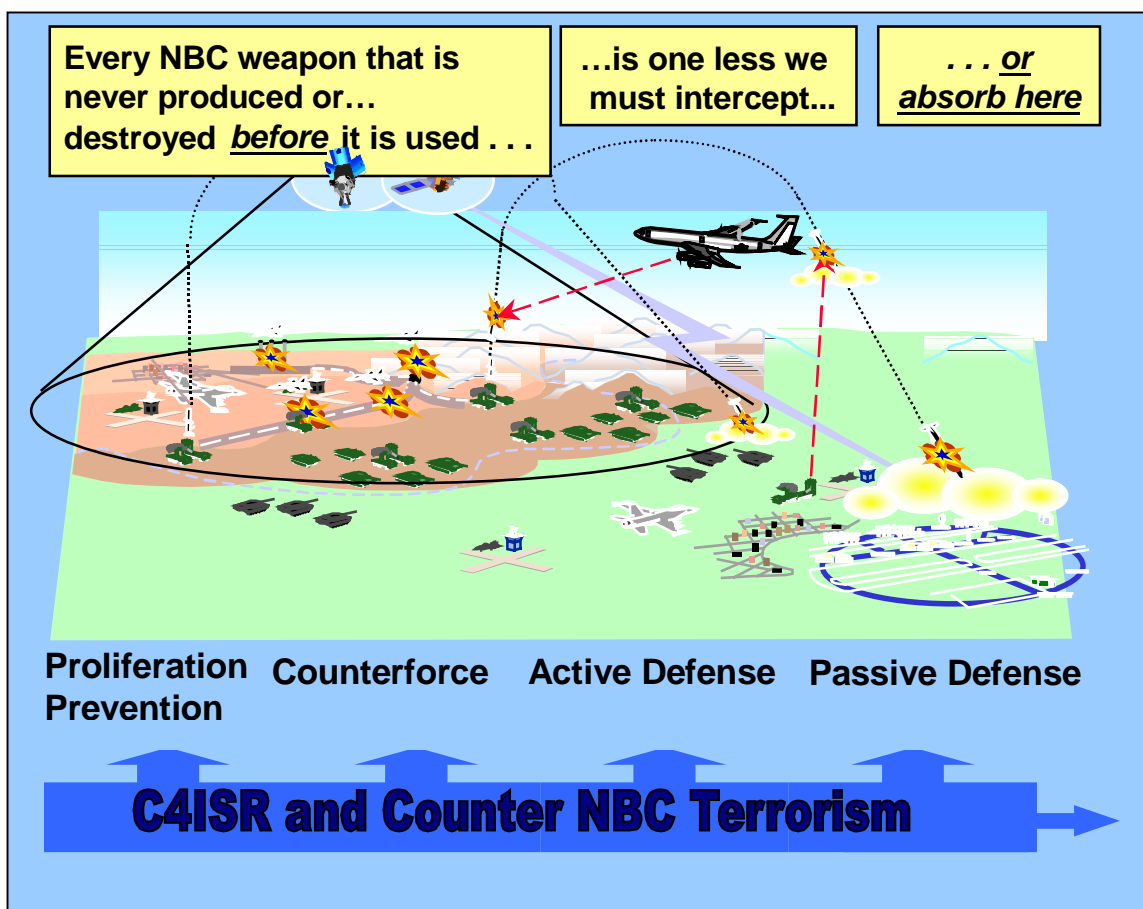


Figure 2.1. USAF's Balanced and Integrated Approach

Together counterforce operations and active defense thin the threat, lessen the number of attacks that friendly forces have to absorb, and reduce the burden on passive defense measures. The fourth component, passive defense, protects personnel from the effects of an NBC attack and enables sustained aerospace combat operations. Two additional elements—ISR and counter NBC terrorism—crosscut and support the four primary components. Proper balance and integration of the four main components, along with the two crosscutting elements, may serve as a deterrent to a potential adversary by denying any significant military advantage from the threat or use of NBC weapons and may enable aerospace forces to actively counter NBC threats.



Integration of the four components of counter NBC operations is vital for successful aerospace operations in a NBC environment.

MAJOR COMPONENTS OF COUNTER NBC OPERATIONS

Proliferation Prevention

Proliferation prevention means deterring and denying attempts by would-be proliferants to acquire or expand their NBC capabilities. Air Force forces support proliferation prevention by:

- ✧ Providing inspection, verification, and enforcement support for nonproliferation treaties, NBC control protocols, and export control activities.
- ✧ Helping to identify potential proliferants before they can acquire or expand their NBC capabilities.
- ✧ Planning and conducting denial operations if directed by the National Command Authorities (NCA).

Aerospace power provides unique capabilities to detect the possession or development of NBC weapons. For example, intelligence, surveillance, and reconnaissance (ISR) systems enable the gathering of information on the development and possible deployment of NBC weapons. The Air Force performs many inspection, verification, and enforcement tasks with other Service and government agencies. Proliferation prevention activities include on-site inspections and support to international agreements such as the Non-Proliferation Treaty, Biological Weapons Convention, and Chemical Weapons Convention.



Air Force assets like this OC-135 support proliferation prevention efforts.

Significant effort is needed to monitor research, development, testing, production, and storage programs related to NBC agents, weapons, and delivery systems. Monitoring such programs is complicated by the dual-use nature of equipment and technologies and their integration into civilian industry. Pharmaceutical and petrochemical factories can easily mask chemical and biological production programs, and “peaceful” nuclear reactor complexes can harvest nuclear waste for reprocessing into weapons. Ballistic and cruise missile delivery systems also deserve emphasis due to their capability to project beyond state boundaries and to penetrate traditional defenses.

A successful proliferation prevention effort complements the effects of counterforce operations by reducing the numbers of potential targets. It also assists active defense and passive defense by reducing the likelihood of an NBC attack and decreasing the risk to military operations.

Counterforce Operations

Preventing Nazi A-Bombs



B-17s from the Eighth Air Force's Third Air Division struck the Vemork hydroelectric plant caused light damage but convinced the Germans to move it and another heavy water production facility from Norway to Germany where it would be "safe."

At the inception of World War II, leading physicists on all sides were cognizant of the possible revolution in explosive power that might be extracted from a uranium bomb. However, each side was faced with a huge investment and scientific challenge before theoretical knowledge could be converted into an operational atomic weapon.

American and British nuclear physicists felt they started their A-bomb projects considerably behind their German counterparts, had much ground to make up, and feared Hitler's forces would be the first to have use of atomic arms. This explanation was based on a number of considerations:

- ❖ The high caliber of German theoretical and experimental physicists like Otto Hahn, Paul Harteck, Werner Heisenberg, Fritz Strassman, and Carl-Friedrich Von Weizsacker.
- ❖ German control of Europe's only uranium mine after the conquest of Czechoslovakia.
- ❖ German capture of the world's largest supply of imported uranium with the fall of Belgium.
- ❖ German possession of Europe's only cyclotron with the fall of France.
- ❖ German control of the world's only commercial source of heavy water after its occupation of Norway.

Allied attacks on German nuclear installations from 1941 until the end of 1943 were not effective in doing more than harassing the German nuclear research effort. A key target was the German-controlled heavy water production plant, Norsk-Hydro, at Vemork, Norway. Heavy water was required to conduct nuclear fission experiments and denial of the Norwegian plant's output would cripple the German atomic bomb research effort.

British intelligence recommended destruction of Norsk-Hydro at the earliest possible date. British paratroopers failed in their first raid in late 1942 when their gliders crashed during infiltration. In February 1943, six Norwegian saboteurs dynamited the heavy water facilities and disrupted production at Norsk-Hydro for two months. Upon seeing a resumption of German production at the site, the RAF [Royal Air Force] and American Eighth Air Force dropped over four hundred bombs on the plant on 16 November 1943, inflicting only light damage.

This raid, however, had positive results in that it persuaded the German authorities that Norsk-Hydro was an unsafe location for their heavy water production. Berlin decided to move everything back to Germany. This was a fatal mistake.

British intelligence learned of the timing and route of the German shipment of heavy water to Germany, and positioned a Norwegian saboteur, Knut Haukelid, aboard a ferry carrying all 600 kilograms of Germany's heavy water across Lake Tinnsjoe in Norway borne for Germany. The ferry Hydro sank and, with it, Germany's hopes of getting an atomic bomb before the end of World War II. This was the first antinuclear counterforce operation in history and it worked.

Uncertain of this fact, however, the Allies continued to fear that Germany might achieve the bomb and snatch final victory from defeat before they could overcome the Nazi forces in the field. Allied bombers continued to pound and destroy a number of German research laboratories until the end of the war, further retarding Nazi A-bomb possibilities.

Dr. Barry R. Schneider
Future War and Counterproliferation

Counterforce operations are those operations that are intended to divert, deny, degrade, or destroy selected capabilities of an adversary's NBC capability and its supporting infrastructure before it can be used against friendly forces. The speed, range, and versatility of aerospace forces make them highly suited for counterforce missions. Counterforce operations may be conducted as strategic attack, offensive counterair (OCA), counterland, or countersea.



For counterforce operations, selected capabilities of an enemy's force and its supporting infrastructure include the wide array of mobile and stationary forces, equipment, and functions that can be used to conduct NBC operations at any level—strategic, operational, or tactical. *Planning counterforce operations requires consideration of the effects desired by the joint force commander's (JFC's) objectives, as well as the risk of collateral effects, to help determine appropriate NBC targets.*

The global strike capability of long-range strike aircraft, such as the B-1, provides US forces with a global strike capability that can be used against an adversary's NBC infrastructure.

A wide variety of aerospace forces contribute to our capability to conduct counterforce operations. Wide area munitions may be employed against dispersed terrorist or military capabilities. Precision weapons including earth-penetrating weapons may be employed against fixed installations and infrastructure. Specialized and emerging capabilities including agent defeat weapons may reduce the possibility of unintended consequences. Information operations may be employed against all aspects of enemy NBC activities. Special operations forces (SOF) and the air components of other Services also play vital roles in finding, targeting, and attacking counterforce targets.

The potential release of NBC agents is a key consideration in target and weapon selection. An attack on an NBC target can cause deadly collateral damage in regions where friendly forces operate or plan to operate and where noncombatants reside and work. Additionally, there may be political constraints on NBC target attacks even as aerospace capabilities improve. Options to avoid or minimize release of NBC agents include attacking supporting infrastructure, containment, or neutralization. The Defense Threat Reduction Agency (DTRA) can provide models of effects from biological or chemical weapons release in a given environment to aid operational decision making.

A known counterforce capability may serve proliferation prevention by deterring a potential adversary or forcing them to expend more resources to protect their NBC capability. **Successful counterforce operations reduce the challenges to active and passive defenses and allow them to more effectively intercept and withstand any remaining threat.**

Active Defense

Active defense encompasses actions to detect, divert, or destroy enemy NBC weapons and delivery means while en route to their targets through the use of active aerospace defense and active force protection. Active aerospace defense is direct defense action taken to nullify or reduce the effectiveness of hostile air and missile threats against friendly forces and vital assets which comprises

defensive operations against aircraft, and ballistic and cruise missiles. Active force protection includes measures to defend against or counter a perceived or actual threat and, if necessary, to deny, defeat, or destroy hostile forces in the act of targeting Air Force assets (see the AFDD on *Force Protection*).

Active defenses should be deployed in layered defense that maximizes intercept opportunities against various classes of threats.

With respect to the national and theater missile threat in particular, it is preferred to destroy en route NBC weapons as early and as far away from friendly forces and territory as possible. Defensive counterair (DCA) assets that can intercept conventional air-breathing threats also provide active defense against NBC cruise missiles and aircraft. Active defense against ballistic missiles requires the coordinated efforts of multiple Services and nations. In this area of operations, the Air Force provides considerable aerospace defense capabilities for identification, tracking, battle management, and battle damage assessment.



F-15Cs equipped for defensive counterair (DCA) are a part of counter NBC active defense.

Active force protection against NBC threats encompasses force protection against conventional surface forces, SOF, unconventional warfare, and terrorists employing NBC weapons. See the AFDD on *Force Protection*, for additional information on active force protection. Counter NBC terrorism, one of the two crosscutting elements of counter NBC operations, is closely linked to active force protection.

Joint planning considerations for active defense should include defense design; engagement and sensor employment; communications networks; deconfliction of NBC targets to minimize or avoid fallout; and development and prioritization of a defended asset list that ensures continued operation of critical aerospace forces and activities.

Active defense capabilities assist proliferation prevention through deterrence or by forcing adversaries to expend more resources on alternate delivery means. Successful active defense operations complement counterforce operations by forcing an adversary to alter their attack strategy, increase attack magnitude, and expose more of their NBC assets, making them more vulnerable to counterforce operations. Active defense operations further thin the threat, reducing the challenges to passive defenses, increasing the ability of friendly forces to survive to operate.



Active force protection is part of counter NBC active defense.

Passive Defense

NBC passive defense measures improve the capability of personnel to survive and sustain operations in an NBC environment.

The extensive and pervasive nature of NBC contamination makes passive defense requirements the responsibility of every airman, not just a handful of specialists. Despite the effectiveness of proliferation prevention, counterforce, and active defenses to limit or degrade an adversary's opportunities to deliver NBC attacks, some weapons may reach their targets. Commanders need to assess the threat in relation to the mission and determine appropriate passive defense measures. For example, immunizations and pre-exposure chemoprophylaxis along with protective gear and equipment can help reduce the effects of NBC agents. *Passive defense consists of contamination avoidance, protection, and contamination control.*



Passive defense is the last line of defense among the components of counter NBC.

- ✧ **Contamination Avoidance.** Avoidance means taking actions to minimize the impact of an NBC attack and to reduce the effects of the NBC hazard. Successful avoidance results from the combination of detection and identification, prediction, marking, dispersal, relocation and rerouting, and sampling.
- ✧✧ **Detection and Identification.** Detection enables early warning while identification provides the information necessary for a tailored response. NBC detection includes the use of NBC point detection, standoff detection, counterintelligence, medical intelligence and risk assessment, human intelligence, signals intelligence, specialized teams, and operational and national intelligence assets.
- ✧✧ **Prediction.** Predictions regarding the movement of contamination can be made when timely warning and information are available. Accurate prediction requires information like type of agent, release point and time, terrain, air stability, and other meteorological data. Prediction methods range from simple manual methods to sophisticated computer models.
- ✧✧ **Marking.** Marking can significantly reduce the spread of contaminants and identify areas for decontamination. Chemical-biological (CB) contamination should be marked immediately upon recognition to prevent unnecessarily contaminating other personnel, equipment, and materials.
- ✧✧ **Dispersal.** In a *preattack environment*, relocating forces for the purpose of increasing survivability is sometimes used. Dispersal moves mission-essential functions and personnel from high-risk to low-risk target areas for survival, recovery, and reconstitution.
- ✧✧ **Relocate or Reroute.** In a *postattack environment*, relocation or rerouting is used as an avoidance option. For aerospace forces, this may require relocating operations to a different area on a base, moving assets that are not contaminated to an alternate operating location, changing routing of force movement, or using forces located elsewhere. However, preparation is required to successfully relocate and operate.
- ✧✧ **Sampling.** Procedures facilitating laboratory analysis and verification of NBC attacks.
- ✧ **Protection.** When contamination cannot be avoided, protection provides the force with survival measures to operate in an NBC environment. *Protection is afforded by individual protective equipment, collective protection, and fixed facilities.* Fixed facilities can be hardened to provide toxic free areas using protective kits. Covering or moving to safe locations can protect equipment. Other personnel protection includes vaccinations, prophylaxis, and exposure assessment.

The joint task force (JTF) or installation commander may choose to increase or reduce the level of protective posture based upon mission requirements and the exact nature of a threat. Certain threats are more persistent or may have multiple hazards such as Mustard Agent, but others may only be dangerous if inhaled. Therefore, the hazards may require different types or levels of protection. For example, if the nature of the threat is respiratory, only the protective mask may be required and the added encumbrance of full protective equipment can be avoided. Therefore, the commander can optimize the performance of his forces and balance the personnel protection level used based upon the proper identification of the threat agents available, the specific hazard of the agents, the amount of the threat agent available, and the threat means of agent weaponization.



The type of agent or agents used will determine the level of protective posture.

✧ **Contamination Control.** Contamination control is a combination of standard disease prevention measures and traditional chemical-biological contamination avoidance and decontamination measures. This includes procedures for avoiding, reducing, removing, waiting for evaporation, or rendering harmless, the hazards resulting from the contamination. Decontamination is a subset of contamination control. As part of the contamination control process, decontamination operations are intended to help sustain or enhance conduct of military operations by preventing or minimizing performance degradation, casualties, or loss of material.

Passive defense enables aerospace forces to continue operations despite the presence of NBC agents. Integration of the four major counter NBC components may also deter an adversary by denying any perceived advantage from using NBC weapons against friendly forces. However, the crosscutting elements support counter NBC operations through proper integration of the major components.

CROSSCUTTING ELEMENTS

Crosscutting elements are those areas that may affect all four components of counter NBC operations. The two crosscutting elements that affect the primary counter NBC components are C4ISR and counter NBC terrorism.

Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR)

Centralized control and decentralized execution are fundamental tenets of US aerospace power. US Air Force C4ISR systems are designed to support these tenets. **Proliferation prevention, counterforce, active defense, and passive defense requirements must be addressed throughout the overall aerospace C4ISR system.** The C4ISR requirements for counter NBC operations will vary depending upon the type of operation, the nature of the threat, and the set of capabilities applied to counter the threat. Counter NBC operations



One of the most visible elements of C4ISR is the venerable E-3 Sentry Airborne Warning and Control System (AWACS) aircraft.

may be single Service, joint, or multinational and may involve US and foreign civil authorities. This demands flexibility and connectivity among strategic, operational, and tactical command and control systems. Effective and interoperable C4ISR systems are vital to planning and conducting successful counter NBC operations.



Command and control (C2) is critical in meeting the types of counter NBC operational challenges a commander may face. The delivery systems for NBC weapons may be difficult to detect, and if employed, may present short warning times. The ability to employ offensive and defensive operations against this threat depends on a C2 structure that enables rapid reaction throughout the battlespace. Mobile targets present an especially difficult challenge to centralized control due to the compressed timeline of the decision loop. To effectively destroy mobile NBC targets such as missile transporter erector launchers (TELs) requires constant ISR and flexible and responsive control of attack assets.

Mobile targets often challenge detection capabilities and require quick decisions to bring aircraft, like this A-10, into a position to deter or destroy the target.

Computers and communication systems are integrated in daily operations in peace and war. These systems enable aerospace forces to rapidly access and disseminate information and decisions.

Intelligence helps commanders assess a potential adversary's NBC capability and intent. Consideration of both is important for reducing the effectiveness of those weapons, planning counterforce operations, determining vulnerabilities of aerospace forces, and planning appropriate active and passive defense measures.

Due to their importance, C4ISR assets are likely targets. Reliance of aerospace forces on space systems, telecommunications, and information technology mandates that these systems be capable of operating even in adverse environments. C4ISR systems should also be protected against information operations (IO) and the debilitating effects of electromagnetic pulse. An enemy's ability to disrupt our decision loop can seriously limit a commander's counter NBC options.

Force protection requires close coordination with all C2 components of counter NBC operations. Security forces, who may be the first to discover an NBC attack on an air base, can provide critical information to medical, intelligence, and others in order to control the attack, minimize casualties, and continue operations.

Intelligence, surveillance and reconnaissance are key elements of counter NBC operations. ISR seeks to detect, identify, and track the development and deployment of adversary NBC weapons. This includes the use of national and theater systems to collect and analyze data, and disseminate the results. The unique signature of NBC weapons, devices, and materials may require use of specialized detectors to complement traditional ISR platforms, such as joint surveillance, target attack radar system (JSTARS); AWACS; and satellites. Vigilant medical surveillance over time may reveal evidence of large-scale biological or chemical production. However, small-scale and portable programs will be more difficult to detect and investigate, and may require more time-urgent methods.

ISR supports all aspects of the counter NBC mission.

In terms of proliferation prevention, ISR monitors the development of NBC weapons allowing the international community to take steps preventing the further development and deployment of NBC. ISR is also a critical supporting component of counterforce. A commander must have accurate ISR data to determine the target types, characteristics, proximity to population centers, and defenses. For active defense, ISR systems play a vital role in detecting, tracking, and warning of air and missile attacks, and may help identify NBC missiles. Additionally, ISR should provide commanders with an assessment of conventional and unconventional capabilities used against friendly personnel. For units within US territory, domestic law enforcement and other agencies that track ongoing criminal activity will probably provide this information. Finally, ISR supports passive defense by providing information on the threat, NBC agent detection, tracking warning, and other information vital to a commander's ability to protect friendly forces.



JSTARS, AWACS, and satellites may need augmentation by specialized detectors due to the unique nature of some NBC targets.

Counter NBC Terrorism

An adversary may covertly deliver NBC weapons by paramilitary forces, or by terrorist acts to counter conventional or technological superiority, or covertly strike for their own cause. Paramilitary or terrorist NBC operations against US forces and infrastructure can occur worldwide, including the continental United States (CONUS). Aerospace forces may be targeted to disrupt the ability to project combat power and airlift from both CONUS and forward-deployed bases. *The nature of the operation, civilian capabilities, legal restrictions (e.g. posse comitatus), and the severity of the threat will guide the preparation and use of US forces.*

Counter NBC terrorism is intertwined with the four major components of counter NBC operations. Awareness of the NBC terrorism threat will focus proliferation prevention efforts, highlighting attempts to acquire or use NBC weapons. Proliferation prevention should make it more difficult for these groups to access NBC weapons. Counterforce operations may remove an identified SOF or terrorist NBC threat before it can be used. Active defense capabilities should be able to defeat incoming NBC threats, and active force protection should include measures to deal



Active force protection includes measures to deal with the NBC terrorist threat.

with this specific threat. Passive defense capabilities will prevent NBC terrorist attacks from degrading the abilities of aerospace forces to project combat power around the globe.

CORE COMPETENCIES AND COUNTER NBC OPERATIONS

The speed, flexibility, and global nature of its reach and perspective distinguish the Air Force's execution of its core competencies from the other Services. The core competencies of the Air Force make it uniquely qualified to counter an opponent's use, or threatened use, of NBC weapons in or through the aerospace environment. Adversary NBC operations may place significant additional burdens on friendly aerospace personnel, equipment, and the logistics system that can be overcome with planning, training, and resources. The proper integration of Air Force core competencies into the JFC's campaign plan may eliminate or reduce the effectiveness of an adversary's NBC weapons.

CHAPTER THREE

COMMAND RELATIONSHIPS

Ring around the rosey,
Pocket full of posies,
Ashes. . .
Ashes. . .
All fall down.

Popular Nursery Rhyme
(Legend says it describes the bubonic plague.)

Command relationships for counter NBC operations will vary depending upon the type of operation, the nature of the threat, and the set of capabilities applied to counter the threat. Counter NBC operations may be single Service, joint, coalition, or multinational and may involve civil authorities from the US and other nations. Counter NBC operations can take place as part of an ongoing military operation or as part of a distinct JTF established for the purpose of countering an NBC threat.

COMMAND AUTHORITY

Counter NBC operations should be integrated into normal command relationships in peace or war.

Aerospace forces may operate under a JFC who exercises combatant command or operational control over the joint force. The joint force C2 support system gives the JFC the means to exercise that authority and direct assigned and attached forces to accomplish the mission. The JFC will determine the priority for NBC operations in the overall campaign plan. The JFC has the authority to appoint a joint force air component commander (JFACC) to direct aerospace operations. The JFACC integrates counter NBC operations into the master air attack plan and allocates sorties for counter NBC operations (though they may be designated OCA, DCA, etc.). The area air defense commander (AADC) (who is normally the JFACC) will coordinate the aerospace operations part of active defense. The JFC may appoint a joint rear area coordinator (JRAC). The JRAC is responsible for coordinating the overall security of the joint rear area and will coordinate force protection to include passive defense requirements across the joint components. Commanders are responsible for force protection of their units, to include active defense and passive defense.



Stealth and precision enhance counter NBC operations.

The command and control of counter NBC operations must consider the supporting as well as the supported commander in chief's (CINC's) capabilities. **Supporting CINCs contribute forces to enhance counter NBC operations and should be included in the deliberate and crisis action planning processes.** Furthermore, because adversaries may also target supporting forces' enabling

capabilities, these enabling assets require NBC defensive plans, even if CONUS-based. Command and control of forward-deployed forces should also receive attention in deliberate planning and exercises as timely warning and control of forces underwrite mission success.

The effects of NBC weapons use will probably not be confined to a specific target area or military installation because of their indiscriminate nature. Commanders should be aware of the shared responsibilities across civil as well as military jurisdictions. Aerospace forces may be asked to provide support in the form of mobility, command and control, medical, and force protection, including passive defense support.

Operations on United States Territory

Counter NBC operations on US territory will be conducted by civilian agencies with support from military forces. The nature of the operation, civilian capabilities, the restrictions of *posse comitatus*, and the severity of the threat will guide the required support and command relationships. Therefore, Air Force personnel should expect to work with personnel from other federal agencies, state and local governments, and the other military Services. *Within the CONUS, the Army's Director of Military Support (DOMS) is the executive agent for the Department of Defense (DOD). Outside CONUS, but on US territory, the appropriate geographic CINC is the executive agent for DOD.* Normally a JFC will be assigned to control DOD support to civil authorities.

In the event of an NBC terrorist incident on a military base in US territory there will likely be parallel lines of command over concurrent aspects of the operation. The installation commander will retain responsibility for ongoing military operations while the Federal Bureau of Investigation (FBI) should assume control over the crime scene. The installation commander may integrate military forces into the FBI response team and provide assistance such as technical expertise, logistics support, and manpower for the entire operation. *Military forces will remain under military command at all times and may provide or receive supplemental support, as appropriate.* Domestic counter NBC operations for military forces will normally fall into two areas: crisis management and consequence management.



The problems associated with NBC weapons use are the same whether used inside or outside of the United States.

✧ **Crisis management includes measures to identify, prevent, and respond to an attack.** Within the CONUS, the FBI, through the US Attorney General, has lead responsibility during crisis management. Aerospace forces may be requested to provide mobility, command and control, and force protection, including passive defense support.

✧ **Consequence management includes measures to provide emergency relief to governments, individuals, and businesses in response to an incident involving NBC weapons or devices.** Primary authority for consequence management rests with the state governments, which may draw upon National Guard assets during the initial stages. The Federal Emergency Management Agency (FEMA) is the lead federal agency, and may request DOD resources through the Attorney General and

the National Security Council (NSC). Aerospace forces may be tasked to support consequence management operations.

COORDINATION WITH OTHER ORGANIZATIONS

The Air Force must be prepared to conduct counter NBC operations in concert with other Services, civilian agencies, coalition partners, and host nations. These entities may have operational capabilities and equipment or, conversely, weaknesses that could play a large factor in the Air Force's ability to survive and fight through the effects of an NBC attack. *Clarifying responsibilities in advance will reduce the potential for confusion in the aftermath of an NBC attack. Developing a thorough understanding of opportunities and capabilities is critical.* Commanders should establish working relationships, remove barriers to sharing information, understand what other entities provide, and resolve equipment interoperability issues. JP 3-08, *Interagency Coordination During Joint Operations*, as well as JP 3-16, *Joint Doctrine for Multinational Operations*, address coordination issues in detail, though they need to be tailored to fit the counter NBC mission.

The commander should make every effort to coordinate Air Force efforts with federal, state and local agencies, host nations, coalition partners, international organizations, and nongovernment organizations (NGO). Due to the asymmetrical nature of NBC warfare, close coordination with civilian counterparts becomes particularly critical. An adversary may attempt to undermine an operation or host nation support by targeting civilian populations, coalition partners and allies, or relief workers. Advance coordination with civilian agencies will minimize vulnerabilities and facilitate rapid response. Additionally, overseas commands have special responsibilities for US citizens and civilian assets in their geographical areas. Responsibilities such as noncombatant evacuation operations (NEO) and other support to US citizens can be streamlined by establishing close relationships with civilian agencies.

Counter NBC operations should be coordinated in advance with host nations and coalition partners. Host nations may have valuable contributions that may be used to augment the capabilities of aerospace forces.

Effective coordination among Air Force and host nation activities enhances overall base operations and preparations for an NBC attack. *The Air Force should develop agreements with the host nation, in coordination with the staff of the regional CINC and the Department of State, to identify and improve coordination, logistics, medical access, and jurisdiction concerns.*



The US Army Medical Research Institute of Infectious Diseases (USAMRIID) is the only DOD laboratory equipped to safely study hazardous viruses. This includes highly contagious diseases such as Ebola, Marburg, and smallpox.

Terrorist Attack in Tokyo



Tokyo subway system targeted by Aum Shinrikyo.

Acupuncturist Chuizuo Matsumoto, better known as Shoko Asahara, founded the group Aum Shinrikyo, or Aum Supreme Truth, in the early 1980s. Licensed in Japan as a religious organization in 1989, Aum was one of thousands of similarly registered groups, many of which claimed to offer spiritual refuge for Japanese alienated by the country's materialism. Aum promoted a version of Tibetan-style mysticism and promised extrasensory experiences as a path to enlightenment.

Asahara soon revealed his desire for political power. In the fall of 1989 he declared his intent to become "a spiritual dictator, a dictator of the world," according to Japanese press reports. In 1990, Asahara and 24 members of Aum campaigned for seats in the Lower Diet (parliament) but failed to win seats. Subsequently, Asahara began to presage a final cataclysmic war using nuclear and chemical weapons between Japan and the United States that would take place in 1997.

Press reports speculate that Aum's chemical attack in Tokyo on March 20, 1995, was aimed at the Japanese National Police Agency (NPA) in an attempt to stop impending raids on the cult's facilities by creating panic throughout Japan.

Aum targeted the three Tokyo subway lines—Hibiya, Marunouchi, and Chiyoda—that pass through the Kasumigaseki station and service the major concentration of government ministries and the NPA. At the height of morning rush hour, 11 plastic bags wrapped in newspaper were punctured with sharp objects, such as umbrella tips, as the perpetrators left the trains. Statements from witnesses reported by the press indicated that the attackers were dressed in "normal" street garb – business suits, sunglasses, and surgical-type masks, which are common on the streets of Tokyo.

In all, 15 subway stations and three train lines were affected by the dispersal of the chemicals. Twelve people died, and approximately 5,500 people required medical treatment, with the highest number of casualties at the Kasumigaseki, Hibiya, and Tsukiji stations.

Japanese authorities determined that Aum had produced the chemical nerve agents sarin and VX. Further probing after the March 1995 attack indicates that this was not the first or last use of chemical or biological agents by the cult. In all, the cult appears to have conducted at least 2 biological attacks with anthrax and botulinum toxin and 5 chemical attacks with sarin and cyanide, including the Tokyo subway attack. These attacks met with varying success.

The Aum was able to legitimately obtain all of the components it needed to build its sizable chemical and biological infrastructures. However, terrorists and violent sub-national groups need not acquire the massive infrastructures of the Aum. Only small quantities of precursors, available on the open market, are needed to manufacture deadly chemical and biological weapons for terrorist acts.

The Biological and Chemical Warfare Threat
Revised Edition 1999

CHAPTER FOUR

PLANNING AND SUPPORT OPERATIONS

Performance means initiative—the most valuable moral and practical asset in any form of war.

Sholto Douglas

GENERAL

Counter NBC operations require a broad range of planning and support considerations. These include operational risk, targeting, logistics, health service support, and legal issues. All of these factors are critical to the Air Force's capability to counter the threat or use of NBC weapons. Plans for proliferation prevention, counterforce, active defense, and passive defense operations, to include relevant application of the crosscutting elements, must be coordinated among US component commands, allies, and host nations. This ensures aerospace forces can supply the combat and combat support capabilities for which they were created, to achieve the desired strategic, operational, and tactical effects.

Integration at the strategic, operational, and tactical levels is necessary to coordinate counter NBC actions and coordinate efforts across disciplines. *Commanders integrate personnel and resources from diverse specialties and assemble plans and intelligence to defeat NBC threats.* Each major component of counter NBC operations is dependent upon the others to reduce adversary capability and maximize effectiveness.



Integration with the other military services, coalition forces, US and host nation civil authorities is vital for success in counter NBC operations.

OPERATIONAL RISK

NBC threats can come from multiple sources. They can be unexpected and employed through a broad range of tactics from clandestine operations to large-scale attacks. They may be intended to cause psychological distress, diversion, or hinder operations or they may be designed to cause massive casualties and force withdrawal. Identifying and quantifying the risks involved requires a concerted intelligence effort against potential aggressors. *Operational risk assessments, based upon this information, are essential to devising a synergistic counter NBC operation.* The risk assessment process is vital to determining the priority trade-offs among types of mission equipment deployed in the early stages of operations. For example, early deployment of unique counterforce, active defense and passive defense equipment could displace assets needed for offensive operations. Operational risk assessments consolidate and clarify issues so that leaders are able to make informed decisions concerning application of the Air Force core competencies to the NBC threat.

Not all NBC agents have the same impact on operations. Agents have different degrees of lethality and persistence. Different delivery means create different concentrations and areas of contamination. Finally the impacts from adversary use of nuclear, biological, and chemical capabilities vary significantly across the spectrum of conflict from peace to war termination. *Commanders may choose to increase or reduce the level of protective posture based on mission operations tempo and the exact nature of the threat faced at the time.*



The terrorist attack on Khobar Towers demonstrates the risk to deployed US forces from clandestine operations.

Commanders should consider operational risks to their personnel, assets and overall fighting ability prior to target consideration and development. Attention toward dispersal of these assets, provisions made with health services support teams, legal concerns, as well as preparation of living and working facilities are of paramount consideration. Other assets such as the Air Force Office of Special Investigations and Federal Bureau of Investigation are examples of intelligence support available to the commander during this risk analysis and preparation phase.

TARGETING CONSIDERATIONS

Types of Targets

Targets fall into three general categories: planned, immediate, and time-sensitive.

Planned targets are those whose existence and location are known in advance and made inclusive in the normal targeting cycle. Examples range from targets on joint target lists (JTLs) in the applicable campaign plan, to targets detected in sufficient time to list in the air tasking order (ATO), mission-type orders, or fire support plans. Planned NBC target examples include fixed NBC production and storage facilities. These facilities may be located in remote or urban areas and may be sheltered in hardened and deeply buried structures or hidden among other urban structures increasing the difficulty of effectively striking the target while minimizing collateral damage.

Immediate targets are those which are detected too late to be included in the normal targeting process. Immediate targets may be unplanned or unanticipated, are either known to exist but not yet located, or are unexpected. (Examples of immediate targets are typically the same as described above for planned targets.)

Time-sensitive Targets (TSTs) are those which require immediate response before they pose (or soon will pose) a clear and present danger to friendly forces or those which are highly lucrative, fleeting targets of opportunity. These may have an extremely limited window of vulnerability or opportunity, the attack of which is critical to ensure successful completion of the



Stealth, precision, and long-range aircraft such as this B-2, provide planners for counter NBC operations with viable options to produce success.

JFC's operation. Time-sensitive targets can be both planned as on-call targets or unplanned or unanticipated immediate targets once detected or located. A TST may be identified when a TEL is exposed during deployment to a remote operating location and during launch preparation. Mobile NBC targets challenge detection, identification, and response capabilities.

Prestrike Planning

The release of NBC agents may be a direct result of proliferation prevention denial operations, counterforce operations, or active defense operations. Civilians, allied and US military personnel can be affected. As a result, all strikes against NBC targets need to be carefully planned and coordinated.



The air operations center is where counter NBC operations are integrated into the joint air operations plan (JAOP).

Before strikes can be made against any target, a commander needs accurate ISR. Information is needed on target characteristics, such as NBC agent production, storage, weaponization, and delivery sites. This information should be used to avoid or minimize NBC agent release and to plan the correct force mix to neutralize the target. Equally important is the assessment of adversary concepts of operations for NBC weapons employment and delivery, as these may define the parameters of specific counterforce missions and determine the synergistic mix of counterforce, active defense, and passive defense.

NBC targeting must consider the type of agents and their containment within facilities and vehicles, facility hardening, proximity to population centers, and adversary active and passive defenses to include antiaircraft weapons systems. The law of armed conflict (LOAC) and its relation to noncombatants and friendly forces is another factor to consider. As mentioned earlier, DTRA provides models and analysis that can significantly aid critical decision making. All of these target considerations affect the mission planning to determine the correct force mix and weapons choice to successfully defeat the enemy's NBC capability with minimum collateral effects.

ISR should provide as much information as possible on the agent disposition within a storage area to enable effective modeling of collateral damage. Essential elements of information include the types of agents, disposition, location, storage, employment area and demographics to effectively predict counterforce effects. Automated planning tools provide target modeling that assists decision making regarding the risks associated with collateral effects. Large-scale research, development, and production may be detected through the construction of the facilities, which can be investigated through human and sensor means. Reconnaissance is critical in the post-attack phase to identify battle damage assessment including agent dispersion. This enables follow-on attacks and allows friendly forces to avoid the "plume" and contamination.

LOGISTICS AND SUSTAINING OPERATIONS

Logistics considerations such as the flow of war materiel to the theater of operations are essential supporting elements of US wartime operations. Adversary NBC operations present unique challenges to logistics support by introducing the threat of contamination to aircraft, war materiel, and logistics personnel. *A knowledgeable adversary will understand the dependence of US*

forces on the logistics system and personnel in the theater. Enemy NBC operations hold the promise of exceptional disruption to US wartime objectives if such NBC operations can be successfully executed. Deliberate planning and implementation processes must be employed to ensure that: the flow of critical mission essential consumables proceeds in a timely manner; the exposure of required materiel to NBC environments is minimized; logistics personnel are appropriately trained and equipped for NBC environments; the support system retains its agility while minimizing its footprint in the targetable area; and support operations are coordinated with counterforce, active defense, and passive defense measures, as required.



Airlift is vital to supporting deployed forces particularly in an NBC environment.

NBC logistic support requirements should be based on the most current threat assessments. Complete protection packages require significant airlift capability. Prepositioned assets, equipment carried by deploying units, and consumables (i.e., individual protection equipment (IPE), filters, etc.) should be used. The right level of mission essential consumables must be added to the logistics flow in a timely manner. Lists of required materiel should be visible to logistics planners to reduce movement of equipment into or out of an NBC environment. Retaining all on-site NBC protective equipment when teams redeploy will reduce transportation support for sustained operations. *The support system must be agile enough to provide needed weapons, supplies, and facilities on short notice and also be able to reduce the targetable "footprint" of deployed forces to a minimum.* This is especially important to counter NBC operations as they are likely to be short notice and may require the full spectrum of counterforce and active and passive defense capabilities.

Planning should consider circumstances that might preclude civil/Civil Reserve Air Fleet (CRAF) aircraft from operating in a theater. Alternatives may need to be identified where civil cargo/passengers may be transferred to other transportation means (sea, rail, intratheater, etc.) for onward movement. Additionally, *if a significant number of military airlift aircraft become contaminated, segregation of clean and contaminated assets should be considered.* Until internationally recognized scientific standards and established legal requirements for acceptable decontamination levels have been established, some nations may deny transit rights. Contaminated human remains should be temporarily interred or decontaminated before they can be transported, in accordance with JP 4-06, *Joint Tactics, Techniques, and Procedures for Mortuary Affairs in Joint Operations*.

HEALTH SERVICE SUPPORT OPERATIONS

NBC weapons present unique medical challenges, which affect activities ranging from active medical surveillance, aerospace medicine, preventive medicine, and clinical analysis, to risk management. Aerospace medical support assists commanders in identifying possible NBC threats and being prepared to mobilize, deploy, and provide quality medical support and health care to aerospace personnel, to allow sustainment of operations.



Medical personnel may need to work in protective equipment in a passive defense NBC environment.

The effects of most chemical and biological warfare (CBW) agents can be prevented through immunization, pre- and post-exposure chemoprophylaxis, and protective clothing. These passive defense measures help deny access of chemical and biological agents to lungs, digestive tract, and skin. Communication between line and medical personnel is critical in assessing potential environmental or other NBC exposure risks. Once NBC has been used, identification of agents is critical to further operations. Education, training, and effective exercises play a big part in countering the affects of NBC agents.

Medical personnel should be prepared, trained, and organized to meet combat and combat support requirements despite the complicating presence of NBC weapons and their effects. The following medical missions apply to counter NBC operations: medical intelligence, casualty management, and aeromedical evacuation.

Medical Intelligence

The Armed Forces Medical Intelligence Center (AFMIC) advises the theater surgeon of the medical threats by evaluating a potential adversary's NBC capabilities. Medical intelligence should encompass indigenous and enemy threats; a concise description of all national medical resources in the deployment area, to include availability and capabilities of host nation, joint, or coalition-held medical assets; and the effects of operating in a mission-oriented protective posture (MOPP). Constant medical surveillance looking at local disease incidence may also reveal and identify sources of large-scale chemical and biological production facilities by the effects caused by possible leakage or other by-products. The theater surgeon can then advise the commander of the appropriate actions required to permit his personnel to function effectively and safely in the affected theater of operations.

Casualty Management

Air Force medical providers must be trained to perform medical management of NBC casualties. In an NBC environment, limited medical assets may be quickly exhausted. Addressing supplies, logistics, and personnel is a priority. Medical treatment of casualties is difficult in protective equipment, and medical personnel require protected medical facilities to effectively conduct medical operations. Medical planners should have detailed mass casualty plans.

Aeromedical Evacuation

Aeromedical evacuation (AE) of casualties will be challenging under NBC conditions. Potentially contaminated patients must be decontaminated before entering the AE system unless the theater and US Transportation Command (USTRANSCOM) CINCs direct otherwise. *Decontamination and processing procedures must be in place to prevent spreading the NBC agent and assure the appropriate protection for patients, aircrew, and aircraft.* Medical decontamination teams identify and neutralize contaminants and perform early diagnoses to protect AE crewmembers and other patients. Once patients are externally decontaminated, further AE decisions are based upon



One use for the C-9 NIGHTINGALE is aeromedical evacuation.

actual or suspected clinical diagnosis and patient condition(s). Commanders, AE, and medical personnel should apply specific contamination control measures.

Biological warfare (BW) casualties may be evacuated by using basic infection control guidelines. *Evacuating the patients and other potentially contaminated patients requires the approval of the destination country, overflight privileges, and approval of any country where the aircraft will land for servicing or where patients will remain overnight.* Close coordination between the supporting and supported CINCs and the Department of State is required for such movements.

LEGAL ISSUES

Use of NBC weapons by an adversary could have significant consequences in terms of legal ramifications in the international community. Commanders need to know that the US Government will require evidence and specimens in order to start the appropriate international actions and to determine the appropriate US reactions since an adversary may deny the use of NBC weapons. Collecting specimens, recording events, and establishing formal legal chain-of-custody for all evidence is required. Similarly, *the commander needs to understand the potential legal ramifications of any decision that could result in collateral damage and understand the procedures for making such decisions.* During operations, the commander and staff should have access to and seek legal advice as needed.



Military dependents, civilian employees, and contractors should be considered when planning passive defense and evacuation.

CHAPTER FIVE

EDUCATION, TRAINING, AND EXERCISES

Perhaps the most valuable result of all education is the ability to make yourself do the thing you have to do, when it ought to be done, whether you like it or not.

T. H. Huxley

Education and training, supported by realistic exercises and wargames, are vital to ensure the Air Force can conduct counter NBC operations. Combat forces operating from CONUS and overseas forward-deployed air bases can maintain sortie generation rates and support operations in an NBC environment only if Air Force personnel understand NBC threat environments and have perfected counter NBC operation skills.

EDUCATION

Air Force personnel must have the requisite knowledge to perform counter NBC operations across the spectrum of military operations. The goal of education must be to ensure that all Air Force personnel understand the principles, threat environment, agent characteristics, and appropriate actions to take to counter the NBC threat. *Success in counter NBC operations requires the active participation of all members of the Air Force and thus, all must understand the nature of operating in the NBC environment.* Air Force personnel with responsibilities for counter NBC functions should also understand the capabilities possessed by other Services, host nation militaries, and appropriate civil agencies.

Formal education on counter NBC should be given at all levels of an airman's career, regardless of position or rank. Commanders need sufficient education to enable effective decision making in an NBC environment.

TRAINING

Training programs to prepare individuals to function in an NBC environment should include individual, unit, and staff courses.

Training should examine:

- ★ Counterforce activities such as sortie generation, and identifying and destroying NBC targets.
- ★ Active defense training to counter en route aerospace and surface NBC threats, to include operations with other Services and nations.
- ★ Basic passive defense measures to ensure base defense, survival, and recovery; and knowledge of how the air base should function cohesively to survive and operate in an NBC environment.



This posed instructional picture from World War I graphically portrays the need for proper training and practice.

Accession Training

Accession training prepares members for service by providing indoctrination to the military culture, organization, and mission. The pervasive nature of the NBC threat requires that basic training includes a review of the NBC threat and discussion of the relevant combat skills needed to defend and operate in an NBC environment. Additionally, locating and training personnel bypassed by accession NBC training is vital to enable all Air Force units to operate in an NBC environment. *The NBC threat exists at every assignment location, so training should reinforce the concept that countering the NBC threat is everyone's responsibility.*

Operational Training

The goal of operational NBC training is to underwrite the ability of groups, teams, and/or units to work effectively in an NBC environment. Operational training should build on the basics taught in accession training to provide the necessary technical skills to ensure mission accomplishment in a hostile nuclear, biological, or chemically hazardous environment. Operational training may also include specialty training to help conduct counter NBC-specific functions or skills to augment NBC technicians.

Continuation or Recurring Training

Continuation or recurring training maintains and refines skills necessary for a unit to conduct their mission in a NBC-threatened/contaminated environment. Since continuation or recurring training sharpens knowledge of counter NBC functions and operations, this training should meet the highest standards. This training should provide the means to keep Air Force personnel current on changes in counter NBC policies and procedures. Additionally it will prepare them for increased responsibility, to include training others, leading forces, and planning counter NBC operations.

Ypres, April 1915: The First Successful German Chemical Attack



German chlorine gas clouds supposedly at Ypres on 22 April 1915.

The concept of creating a toxic gas cloud from chemical cylinders was credited to Fritz Haber of the Kaiser Wilhelm Physical Institute of Berlin in late 1914. Owing to a shortage of artillery shells, Haber thought a chemical gas cloud would negate the enemy's earthworks without the use of high explosives. In addition, gas released directly from its storage cylinder would cover a far broader area than that dispersed from artillery shells. Haber selected chlorine for the gas since it was abundant in the German dye industry and would have no prolonged influence over the terrain.

On 10 March 1915, under the guidance of Haber, Pioneer Regiment 35 placed 1,600 large and 4,130 small cylinders containing a total of 168 tons of chlorine opposite the Allied troops defending Ypres, Belgium. Haber also supplied the entire regiment with Draeger oxygen breathing sets, used in mine work, and a portion of the surrounding German infantry with small pads coated with sodium thiosulfate. Once the cylinders were in place, the Germans then waited for the winds to shift to a westerly direction.

On 22 April 1915, the Germans released the gas with mixed success. Initially, the Allied line simply fell apart. This was despite the fact that the Allies were aware of the pending gas attack, and British airmen had actually spotted the gas cylinders in the German trenches. The success of the attack was more significant than the Germans expected, and they were not ready to make significant gains despite the breakthrough. In addition, fresh Allied troops quickly restored a new line further back. The Allies claimed that 5,000 troops were killed in the attack, but this was probably an inflated number for propaganda purposes.

Medical Aspects of Chemical and Biological Warfare

Commanders must ensure their units are trained and able to perform in NBC threat environments. Continuation training enables a commander to assess organizational capabilities and to maintain the unit's ability to survive and operate in NBC threat environments.

EXERCISES AND WARGAMES

Exercises should include a realistic NBC element and the requirement that participants demonstrate their skills in personal protection, performing wartime functions, and working together as an integrated unit in a NBC contaminated area. An exercise should emphasize all aspects of operations in an NBC environment including command and control, planning, logistics, medical response, force protection, and individual and collective protection. Where possible, Air Force units should also conduct joint and coalition counter NBC exercises to develop and improve interoperability.

Wargame scenarios should test existing and future counter NBC operations. At the strategic level, senior leaders develop judgment in applying the core competencies across the range of military operations to counter NBC threats. At the operational level, wargames emphasize judgment in the employment of aerospace forces to counter NBC weapons. Realistic exercises (those with joint, interagency and coalition partners) and wargames are essential to discovering shortfalls and implementing effective corrective actions. *Commanders should continually assess the impact of training and wargames on their units' abilities to conduct wartime missions.*

The current and future threat of an NBC attack on US Air Force operations demands the implementation and utilization of effective counter NBC education and training. At each level of training, a working knowledge of counter NBC operations is essential. Counter NBC education and training must include realistic survive-to-operate exercises and scenarios, in-depth and basic instruction, and cross-functional involvement to be effective in the event counter NBC operations are needed.

SUMMARY

The Air Force's ability to deploy overwhelming force, apply highly-accurate precision attack, and provide robust logistical support are important to the full range of US military operations. These capabilities also make aerospace bases, personnel, and systems potential NBC targets. NBC attack or the threat of NBC attack can adversely affect the full range of aerospace operations. Aerospace forces prepare to counter the NBC threat by properly blending proliferation prevention, counterforce, active defense and passive defense. Furthermore, proper use of these four components of counter NBC operations can deter an adversary from choosing to employ NBC weapons.



A simulated SCUD during an exercise is a reminder of how vital it is to integrate the four components of counter NBC operations.

At the Very Heart of Warfare lies Doctrine . . .

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Glossary

Abbreviations and Acronyms

AADC	area air defense commander
AE	aeromedical evacuation
AFDD	Air Force Doctrine Document
AFMIC	Armed Forces Medical Intelligence Center
AFRC	Air Force Reserve Command
ANG	Air National Guard
AOC	air operations center
ATO	air tasking order
AWACS	Airborne Warning and Control System
BW	biological warfare
C2	command and control
C4ISR	command, control, communications, computers, intelligence, surveillance, and reconnaissance
CB	chemical-biological
CBW	chemical and biological warfare
CINC	commander of a combatant command; commander in chief
CONUS	continental United States
CRAF	Civil Reserve Air Fleet
DCA	defensive counterair
DOD	Department of Defense
EMP	electromagnetic pulse
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
IO	information operations
IPE	individual protective equipment
ISR	intelligence, surveillance, and reconnaissance
JAOP	joint air operations plan
JFACC	joint force air component commander
JFC	joint force commander
JP	joint publication
JRAC	joint rear area coordinator
JSTARS	joint surveillance, target attack radar system
JTF	joint task force
JTL	joint target list
JTMD	joint theater missile defense

LOAC	Law of Armed Conflict
MOPP	mission-oriented protective posture
NATO	North Atlantic Treaty Organization
NBC	nuclear, biological, and chemical
NCA	National Command Authorities
NEO	noncombatant evacuation operation
NGO	nongovernmental organization
NSC	National Security Council
OCA	offensive counterair
RDD	radiological dispersal device
SOF	special operations forces
TEL	transporter erector launcher
TMD	theater missile defense
TST	time sensitive target
UAV	unmanned aerial vehicle
USAMRID	US Army Medical Research Institute of Infectious Diseases
USTRANSCOM	US Transportation Command

Definitions

active aerospace defense. Direct defensive action taken to nullify or reduce the effectiveness of hostile aerospace action. It includes such measures as the use of aircraft, aerospace defense weapons (i.e. TMD), weapons not used primarily in an aerospace defense role, and electronic warfare. [Air Force definition replaces “air” with “aerospace.”]

active defense. The employment of limited offensive action and counterattacks to deny a contested area or position to the enemy. See also passive defense. (JP 1-02) *[To detect, divert, or destroy enemy NBC weapons and delivery vehicles while en route to their targets through the use of active aerospace defense and active force protection.]* {The italicized definition in brackets is used in the context of this document because it best describes the desired effect.}

active force protection. Measures to defend against or counter a perceived or actual threat and, if necessary, to deny, defeat, or destroy hostile forces in the act of targeting Air Force assets. (AFDD 2-4.1, *Force Protection*)

airlift. Operations to transport and deliver forces and materiel through the air in support of strategic, operational, or tactical objectives. (AFDD 1)

battlespace. The commander's conceptual view of the area and factors which he must understand to successfully apply combat power, protect the force, and complete the mission. It encompasses all applicable aspects of air, sea, space, and land operations that the commander must consider in planning and executing military operations. The battlespace dimensions can change over time as the mission

expands or contracts according to operational objectives and force composition. Battlespace provides the commander a mental forum for analyzing and selecting courses of action for employing military forces in relationship to time, tempo, and depth. (AFDD 1)

biological agent. A microorganism that causes disease in personnel, plants, or animals or causes the deterioration of materiel. (JP 1-02)

chemical agent. A chemical substance which is intended for use in military operations to kill, seriously injure, or incapacitate personnel through its physiological effects. The term excludes riot control agents, herbicides, smoke, and flame. (JP 1-02)

coalition. An ad hoc arrangement between two or more nations for common action. (JP 1-02)

combatant command (command authority). Nontransferable command authority established by title 10 ("Armed Forces"), United States Code, section 164, exercised only by commanders of unified or specified combatant commands unless otherwise directed by the President or the Secretary of Defense. Combatant command (command authority) cannot be delegated and is the authority of a combatant commander to perform those functions of command over assigned forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction over all aspects of military operations, joint training, and logistics necessary to accomplish the missions assigned to the command. Combatant command (command authority) should be exercised through the commanders of subordinate organizations. Normally this authority is exercised through subordinate joint force commanders and the Service and/or functional component commanders. Combatant command (command authority) provides full authority to organize and employ commands and forces as the combatant commander considers necessary to accomplish assigned missions. Operational control is inherent in combatant command (command authority). Also called **COCOM**. (JP 1-02)

command and control. The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission. Also called **C2**. (JP 1-02)

contamination. The deposit, absorption, or adsorption of radioactive material, or of biological or chemical agents on or by structures, areas, personnel, or objects. (JP 1-02)

contamination control. Procedures to avoid, remove, or render harmless, temporarily or permanently, nuclear, biological, and chemical contamination for the purpose of maintaining or enhancing the efficient conduct of military operations. (JP 1-02)

counterair. A US Air Force term for air operations conducted to attain and maintain a desired degree of air superiority by the destruction or neutralization of enemy forces. Both air offensive and air defensive actions are involved. The former range throughout enemy territory and are generally conducted at the initiative of the friendly forces. The latter are conducted near or over friendly territory and are generally reactive to the initiative of the enemy air forces. (JP 1-02) *[A function conducted to attain and maintain a desired degree of air superiority. Counterair integrates and exploits the mutually beneficial effects of offensive and defensive operations by fixed- and rotary-wing aircraft, surface-to-air and air-to-air missiles, antiaircraft guns, artillery, and electronic warfare to destroy or neutralize enemy aircraft and missile forces both before and after launch.]* {Italicized definition in brackets applies only to the Air Force and is offered for clarity.}

counterforce. The employment of strategic air and missile forces in an effort to destroy, or render impotent, selected military capabilities of an enemy force under any of the circumstances by which hostilities may be initiated. (JP 1-02) *[Operations that are intended to divert, deny, degrade, or destroy an adversary's NBC capability and its supporting infrastructure before it can be used against friendly forces.]* {The italicized definition in brackets is used in the context of this document because it best describes the desired effect.}

counter NBC. Activities taken to detect, deter, disrupt, deny, or destroy an adversary's NBC capabilities and to minimize the effects of an enemy NBC attack on operations. The main interlinked components of counter NBC operations are proliferation prevention, counterforce, active defense, and passive defense. There are also two crosscutting elements that affect the primary counter NBC components: command, control, computers, communication, intelligence, surveillance, and reconnaissance (C4ISR) and counter NBC terrorism.

counter NBC terrorism. To protect military and civilian personnel, facilities, and logistical/mobilization nodes from paramilitary, covert delivery, and terrorist NBC threats and manage the consequences of these threats both in the United States and abroad.

counterland. Operations conducted to attain and maintain a desired degree of superiority over surface operations by the destruction, disruption, delay, diversion, or other neutralization of enemy forces. The main objectives of counterland operations are to dominate the surface environment and prevent the opponent from doing the same. (AFDD 1)

countersea. Operations conducted to attain and maintain a desired degree of superiority over maritime operations by the destruction, disrupting, delaying, diverting, or other neutralization of enemy naval forces. The main objectives of countersea operations are to dominate the maritime environment and prevent the opponent from doing the same. (AFDD 1)

force protection. Security program designed to protect Service members, civilian employees, family members, facilities, and equipment, in all locations and situations, accomplished through planned and integrated application of combating terrorism, physical security, operations security, personal protective services, and supported by intelligence, counterintelligence, and other security programs. (JP 1-02)

functional component command. A command normally, but not necessarily, composed of forces of two or more military departments which may be established across the range of military operations to perform particular operational missions that may be of short duration or may extend over a period of time. (JP 1-02)

host nation. A nation which receives the forces and/or supplies of allied nations and/or NATO organizations to be located on, to operate in, or to transit through its territory. (JP 1-02)

joint force. A general term applied to a force composed of significant elements, assigned or attached, of two or more military departments, operating under a single joint force commander. (JP 1-02)

joint force air component commander. The joint force air component commander derives authority from the joint force commander who has the authority to exercise operational control, assign missions, direct coordination among subordinate commanders, redirect and organize forces to ensure unity of effort in the accomplishment of the overall mission. The joint force commander will normally designate a joint force air component commander. The joint force air component commander's responsibilities will be

assigned by the joint force commander (normally these would include, but not be limited to, planning, coordination, allocation, and tasking based on the joint force commander's apportionment decision). Using the joint force commander's guidance and authority, and in coordination with other Service component commanders and other assigned or supporting commanders, the joint force air component commander will recommend to the joint force commander apportionment of air sorties to various missions or geographic areas. Also called **JFACC**. (JP 1-02)

joint force commander. A general term applied to a combatant commander, subunified commander, or Joint Force Commander authorized to exercise combatant command (command authority) or operational control over a joint force. Also called **JFC**. (JP 1-02)

joint rear area coordinator. The officer with responsibility for coordinating the overall security of the joint rear area in accordance with joint force commander directives and priorities to assist in providing a secure environment to facilitate sustainment, host nation support, infrastructure development, and movements of the joint force. The joint rear area coordinator also coordinates intelligence support and ensures that area management is practiced with due consideration for security requirements. Also called **JRAC**. (JP 1-02)

joint task force. A joint force that is constituted and so designated by the Secretary of Defense, a combatant commander, a subunified commander, or an existing Joint Force Commander. Also called **JTF**. (JP 1-02)

joint theater missile defense. The integration of joint force capabilities to destroy enemy theater missiles in flight or prior to launch or to otherwise disrupt the enemy's theater missile operations through an appropriate mix of mutually supportive passive missile defense; active missile defense; attack operations; and supporting command, control, communications, computers, and intelligence measures. Enemy theater missiles are those that are aimed at targets outside the continental United States. Also called **JTMD**. (JP 1-02)

NBC environment. A condition of warfare in which an adversary possesses or uses nuclear, radiological, biological and/or chemical weapons, by-products, infrastructure, and associated delivery methods.

nuclear, biological, and chemical capable nation. A nation that has the capability to produce and employ one or more types of nuclear, biological, and chemical weapons across the full range of military operations and at any level of war to achieve political and military objectives. (JP 1-02)

nuclear weapon. A complete assembly (i.e., implosion type, gun type, or thermonuclear type), in its intended ultimate configuration which, upon completion of the prescribed arming, fusing, and firing sequence, is capable of producing the intended nuclear reaction and release of energy. (JP 1-02)

operational control. Transferable command authority that may be exercised by commanders at any echelon at or below the level of combatant command. Operational control is inherent in combatant command (command authority). Operational control may be delegated and is the authority to perform those functions of command over subordinate forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission. Operational control includes authoritative direction over all aspects of military operations and joint training necessary to accomplish missions assigned to the command. Operational control should be exercised through the commanders of subordinate organizations. Normally this authority is exercised through subordinate joint force commanders and Service and/or functional component commanders. Operational control normally provides full authority to organize commands and forces and to employ

those forces as the commander in operational control considers necessary to accomplish assigned missions. Operational control does not, in and of itself, include authoritative direction for logistics or matters of administration, discipline, internal organization, or unit training. (JP 1-02)

passive defense. Measures taken to reduce the probability of and to minimize the effects of damage caused by hostile action without the intention of taking the initiative. (JP 1-02) *[To protect US, allied, and coalition forces against NBC effects, including measures to detect and identify NBC agents, individual and collective protection equipment, NBC medical response, vaccines for BW defense, and NBC decontamination capabilities.]* {Italicized definition in brackets meets US Air Force operational requirements and is offered for clarity. }

proliferation prevention. To deny attempts by would-be proliferants to acquire or expand their NBC capabilities by: providing inspection, monitoring, verification, and enforcement support for nonproliferation treaties and NBC arms control regimes; supporting export control activities; assisting in the identification of potential proliferants before they can acquire or expand their NBC capabilities; and, if so directed by the National Command Authorities, planning and conducting denial operations.

radiological dispersal device. Any device, other than a nuclear explosive device, that disseminates radiation to cause damage or radiation injury.

tactical control. Command authority over assigned or attached forces or commands, or military capability or forces made available for tasking, that is limited to the detailed and, usually, local direction and control of movements or maneuvers necessary to accomplish missions or tasks assigned. Tactical control is inherent in operational control. Tactical control may be delegated to, and exercised at any level at or below the level of combatant command. (JP 1-02)

theater missile. A missile, which may be a ballistic missile, a cruise missile, or an air-to-surface missile (not including short-range, nonnuclear, direct fire missiles, bombs, or rockets such as Maverick or wire-guided missiles), whose target is within a given theater of operation. (JP 1-02)